

REMARKS

The new Specification submitted herewith is the same Specification filed with U.S. Application No. 09/613,650. However, Applicant has amended the Cross-Reference to related Patent Application section on Page 1 of the Specification and has written new claims which are now included as Pages 64-66. The new Specification contains all of these amended pages and therefore marked-up pages have not been provided.

The instant claims relate to methods and devices that regulate the flow of fluid through a capillary channel using differences in wettability of capillary surfaces to control the forces driving that flow. Particularly, a first surface region within the capillary can be placed adjacent to a second region having a reduced contact angle relative to the first surface region. Fluid traversing the first region can be induced to change direction or rate of flow upon contacting the second region.

The new claims are fully supported by the specification as filed, and do not introduce new matter. For convenience, the following citations of specific support refer to U.S. Patent Nos. 6,019,944 and 6,156,270, which are incorporated by reference in the instant application, and from which the instant application claims priority.

Methods and devices comprising a capillary surface in which fluid traversing a first capillary region comprising a hydrophilic surface to contact a hydrophobic surface can be found, e.g., in U.S. Patent 6,019,944, column 8, line 1, through column 11, line 37, and U.S. Patent No. 6,156,270, column 5, lines 40-50; inducing a change direction or rate of flow upon contacting the second region in U.S. Patent 6,019,944, column 8, lines 10-20 and column 9, lines 27-30; devices comprising a plurality of capillary channels in U.S. Patent No. 6,156,270, column 4, lines 29-30; devices comprising a vent in U.S. Patent No. 6,156,270, column 4, line 36; devices further comprising regions in which differences in capillarity induce a change in direction or rate of flow in U.S. Patent No. 6,156,270, column 9, lines 60-65, and column 14, line 62, through column 15, line 8; dried reagents that alter the surface tension of a fluid in U.S. Patent No. 6,019,944, column 5, line 67, through column 6, line 4.

Additionally, the term "contact angle" is well known to those of skill in the art as referring to an equilibrium orientation formed at the interface of a liquid and a solid surface, and is often used in reference to fluids within capillary spaces. The contact angle is related to the van der Waals interaction of fluid molecules for each other and for surface molecules, and thus is related to the composition of the fluid and the surface. For example, the skilled artisan understands that a fluid and a surface that is wettable by that fluid (e.g., an aqueous solution and a hydrophilic surface) will exhibit a contact angle that is greater than the contact angle of the same fluid and a non-wettable surface (e.g., an aqueous solution and a hydrophobic surface). Capillary force is related to surface tension of the fluid and the contact angle.

CONCLUSION

In view of the foregoing amendments and remarks, Applicants respectfully submit that the pending claims are in condition for allowance. An early notice to that effect is earnestly solicited. Should any matters remain outstanding, the Examiner is encouraged to contact the undersigned at the address and telephone number listed below so that they may be resolved without the need for additional action and response thereto.

Respectfully submitted,

By 

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